Proposal Reviews

#41: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

Center for Agricultural Partnerships

Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
Delta Regional Review	
San Joaquin Regional Review	
Sacramento Regional Review	
External Scientific Review	#1 #2 #3 #4 #5
Environmental Compliance	
Budget	

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 41

Applicant Organization: Center for Agricultural Partnerships

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	**-**
In Part	**-**
With Conditions	**-**
Consider as Directed Action	**-**
Not Recommended	**X**

Amount: **$0**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None.

Provide a brief explanation of your rating:

Although the proposal is timely and addresses a significant problem, the proposal does not address biological control; is unclear on the benefits provided; its feasibility is uncertain; its relation to similar projects is unclear, and lacks testable hypotheses.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 41

Applicant Organization: Center for Agricultural Partnerships

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	**All scientific panel reviews indicated of good rating. Regional reviews were favorable. If this project obtains funding, then the proposal needs to incorporate the 2 issues identified in products/outcomes (see above): 1) compare the pesticide DPR PUR database. (2) compare the changes in farmers pesticide use levels with the chlorpyrifos concentrations in the rivers by either USGS and regional water boards data. The proposal needed scientific citations to demonstrate the success of the approach with walnut production. The proposal needed to address how the use of the mating disruption technology would reduce pesticide usage if most of the applications would occur in the in-season timeframe, which is not the storm event season.**
-Above average	
XAdequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

   Goals were clearly defined, timely and pertinent. Justification is clear. There was question about the registration needed of the product with DPR? Mating disruption technology has a long and good track record in the research community, especially with other crops such as almonds, pear and apples. Some question, whether the application of the treatment of codling moth is only during in season field application timing only and therefore, less benefit of reduced chlorpyrifos application would have a direct benefit to improved water quality. However, there may be benefits to resident birds in the orchard that would benefit from reduced chlorpyrifos applications.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

   Good approach. However, some concern that the application to 25,000 acres might be ambitious. Some question about the approach not being fully documented. It would have been nice to have had a reference showing successful use of the proposed technology in walnut orchards, although it has been used in pear and apple orchards.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   May need to add 2 components: (1) compare and analyze the pesticide DPR pesticide use report (PUR) data for their counties areas to other areas and trend over the project time. (2) compare the changes in farmers pesticide use levels with the chlorpyrifos concentrations in the rivers data collected by either USGS and Sacramento Regional Water Boards data. Good team of investigators with demonstrated work in this area of work. Annual funding should be contingent on review of progress because the project involves gradual scale-up.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   No cost shares identified. However, collective efforts by the walnut marketing board, Ag advisors, and independent consulting firm. Walnut board will provide in-kind services to communicate with the growers.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   One rank high and one rank as medium. Good local involvement of growers and PCAs with yearly outreach and feedback loops.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

   No budget and environmental compliance issues were identified.

Miscellaneous comments:

None

Delta Regional Review:

Proposal Number: 41

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

The proposal is to reduce the use of OP Pesticides in preference for another chemical (a pheromone), used as a disruptor of a single target species, the codling moth. If the moth is the sole pest targeted by one or more application (preferably a dormant spray) of the OP pesticides, then a successful disruption could reduce pesticide runoff. The issue should be considered by the technical committee.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The proposal is to reduce the use of OP Pesticides in preference for another chemical (a pheromone), used as a disruptor of a single target species, the codling moth. If the moth is the sole pest targeted by one or more application (preferably a dormant spray) of the OP pesticides, then a successful disruption could reduce pesticide runoff. If farmers still require the OP pesticide to control other pests at the same time, then the project is not feasible. The proposal is not clear on this situation.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Reduction of pesticide runoff would be beneficial to aquatic species (MR-5). Much of the aquatic species that are directly affected by OP pesticides are not listed, but serve as a lower trophic level for listed species.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

While the project addresses pesticide runoff, it does not have a link to other restoration activities. OP pesticide runoff from ag continues to be an issue, although the EPA has been working vigorously on reducing impacts of these pesticides. Primarily, the EPA has focused on the household uses of these products.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

   How?

   It involves the Center for Ag Partnerships, which has a history of involving local growers.

Other Comments:

This project needs attention from the technical teams to determine if it were successful, would it actually reduce pesticides in local waterways and by how much.

San Joaquin Regional Review:

Proposal Number: 41

Applicant Organization: Center for Agricultural Partnerships

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

The proposed use of biological control to reduce pest damage is attractive, but the reviewers had concerns about the system and its potential for affecting non-targeted populations. This approach also requires wider outreach and closer coordination with others working in the region.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The goal, to replace conventional insecticide control with the biologically control in 25% of the fields tested, seems realistic. A detailed outreach program explaining the results of the experiment is part of the proposal.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   The priority addressed is reducing degradation of water quality by reducing the amount of pesticide use in specific agricultural orchards.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   The proponent of the study, Center for Agricultural Partnerships, works with agriculture at all levels throughout CA.

4. Does the project adequately involve local people and institutions?

XYes **-**No

How?

The group is working locally with the Walnut Market Board and Diamond Growers, and an outreach program, a critical component of the study, is planned.

Other Comments:

There is concern about the use of pheromones and their specificity. The proposal also mentions a plant hormone, but does not clearly explain how its use fits into the study. The use of polymer beads to deliver the chemical adds another element that may need to be examined for potential adverse effect.

Sacramento Regional Review:

Proposal Number: 41

Applicant Organization: Center for Agricultural Partnerships

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

Overall Ranking: **-**Low **-**Medium **X**High

Provide a brief summary explanation of the committee's ranking:

While the proposal brought up a number of concerns as listed in the summaries below, the panel felt the information such a project would provide is highly important for walnut growers, especially in areas like Tehama County.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Local involvement of growers and PCAs. Not clear, however, whether they are on-board with this project. Project area is wide-spread.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   -Yes **X**No

   How?

   ERP Goal 6: Water & Sediment Quality in Sacramento, San Joaquin, & Merced River Systems, but not specifically called for in PSP.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   -Yes **X**No

   How?

   Other projects were not mentioned. Proponent has experience in other tree crops in other states.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

How?

Growers, PCAs & Farm Advisors, Walnut Board, Blue Diamond. Outreach and yearly feedback loop and programs.

Other Comments:

Positives: Interesting, useful project providing needed info. Good feedback loops.

Negatives: Unclear if local growers and PCAs are onboard and ready to give a fair amount of time to the project. 25K acres is a lot to implement and the project actually only addresses a limited number of test plots of <20 ac ea. Budget seems high.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **41**

Applicant Organization: **Center for Agricultural Partnerships**

Proposal Title: **Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**This reviewer believes the mating disruption approach is preferable over pesticide application. Will mating disruption occur in more beneficial insects, which might present a problem?**
-Good	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   Rating: Excellent. Three primary objectives are adopting a process for sprayable disruption to the codling moth, providing science base to decision-making, and validating kairomone-based lure for assisting the mating disruption.

2. **<u>Justification.</u>** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Rating: Excellent. The dire need of the walnut industry for a solution make this proposal a viable alternative to the pesticide application currently in use.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   Rating: Excellent. Well documented approach and conceptual model. Public outreach included as a key component.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   Rating: Excellent. The applicants provide strong rationale for feasibility, citing similar studies that were successful.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Rating: Very Good. Good articulation of performance measures. The actual quantification for reduction of loadings not given.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Rating: Excellent. Strong public outreach component in addition to technical.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   Rating: Excellent. Strong experience and capabilities.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Rating: No comment.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **41**

Applicant Organization: **Center for Agricultural Partnerships**

Proposal Title: **Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**Proposal could make a serious contribution towards reducing organophosphate in-season sprays for walnut. Proposal does not address biological control (action of natural enemies), is a bit grandiose, a little overpriced, and lacks docuemntated commitment for key collaborators.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   Yes. Yes.

2. **<u>Justification.</u>** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Yes. YEs. Research/Demonstration hybrid: Yes.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   Does not use a cross-media approach for pollution reduction, so is not as holistic as BIOS. Does not emphasize or evaluate biological control of codling moth (e.g. by the newly introduced parasitic wasps or by resident predators, such as native spiders). Thus, the proposed approach to pest management is not as fully integrated as could be the case. Still, it involves two major tactics, which would be an improvement over the prevalent agrochemical approach.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The approach is not fully documented. Probability of success about 60%. No: The promises are a bit grandiose.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   No: no analysis of Pesticide Use Report (P.U.R.)data is proposed. In-field monitoring looks sufficient to evaluate the effectivenss of the new control technology.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Yes. Yes. Yes.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   O.K. Documentation of collaborators is scant: no letters of commitment from Welter, Bentley or Pickel, and it is unclear what role UC Cooperative Extension Farm Advisors will play. Joe Grant, Farm Advisor in San Joaquin County, has been very much involved in Biologically Integrated Orchard Systems (BIOS), and I have heard second-hand that he collaborates with Pat Weddle, but his role in this proposed project is nowhere specified.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Budget appears excessive given the limited work commitment and the lack of documented cooperators. An expected linkage with Walnut Pest Management Alliance is not established.

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **41**

Applicant Organization: **Center for Agricultural Partnerships**

Proposal Title: **Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This project is of importance to the current situation of needing to reduce pesticide runoff from orchards. The team is experienced in other large scale alternative practices farming. However, it is not clear if the application of the pheromone to control codling moth on walnuts is achievable on a large scale. No letters of support were provided by the key local IPM advisors.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The project goals, objectives and hypotheses are clearly stated. Reduce the use of the op, chlorpyrifos applications to control codling moth in walnuts by the use of a pheromone to disrupt mating cycle. The project is to be applied to 25,000 acres of walnuts over a systematic process over three years.

2. **<u>Justification.</u>** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project

justified?

The approach uses a phased approach of expanding the use of the pheromone over three years to one quarter of the walnut acreage susceptible to codling moth infestation, thereby reducing the applications of chlorpyrifos. Question when are the chlorpyrifos applications occuring (dormant vs in-season)?

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The information will be helpful to the regulators developing the chlorpyrifos TMDLs for the SJ and Sacramento watershed. The timing is post the TMDL development, however, if successful this approach could be identified and phased into the implementation plans. However, on page 3 of the proposal they cite Lee, 2001 when the correct citation would be the Sacramento Regional Water Quality Control Board for the 303 listing in this watershed.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The team has experience in implementation of large-scale projects and has several key personnel for the local implementation aspects. The feasibility of success is not clear from the proposal.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   The measure of success will be based on the five characteristics in the rate of adoption of innovations (see page 5). Under data handling and storage, they should also include comparing the DPR PUR for walnuts over time of the project and pre-project.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The products will be practices that can be used by walnut growers to control codling moth. These practices will be transferred to the agricultural community through the walnut industry in trade publications, and presentations at grower meetings.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The investigators have demonstrated work in the area of pest management practices in other states. However, they do have identified researcher, Dr. Stephen Welter and 2 local IPM advisors to be on the team. No letters were provided for the 2 local IPM advisors.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   No cost share partners identified. However, the project does have collective efforts from the walnut marketing board, Diamond of CA, Ag advisors and an independent consulting firm. The walnut board and Diamond are identified as the mechanism to communicate among growers (in-kind contribution). Overhead costs is low at 10%.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **41**

Applicant Organization: **Center for Agricultural Partnerships**

Proposal Title: **Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

I have met the applicant and contractor, and have heard the applicant discuss his other projects. I also am familiar with the applicant's existing grant -- also for mating disruption to manage codling moth on walnuts -- from my office at US EPA Region 9 (although I am not the Project Officer for that grant).

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	**The proposed work is timely and significant, and offers real hope for reducing use of organophosphate insecticides that have been contaminating the state's surface waters. The applicant's proposed pollution-prevention strategy -- eliminating chlorpyrifos by replacing it with environmentally benign mating disruption pheromones -- is environmentally sound. Moreover, the applicant has a strong track record of working with farmers to implement large-scale reductions in the use of toxic pesticides. For these reasons I strongly support this project.**
XGood	**I also have some concerns about the proposed work: 1. Benefits to Water Quality Are Unclear. I would like to see a clearer explanation of how much impact on water quality will be realized by reducing chlorpyrifos use on walnuts. How much do walnuts contribute to the problem? 2. Feasibility is Uncertain. The success of the mating disruption technology in other crops is given as a justification of why the technology is likely to be adopted in walnuts, but there is insufficient information given on the scale of successful implementation in these other crops. Also, I cannot tell from the proposal if the pheromone technology is registered for large-scale use in the field. 3. Relations with Similar Projects are Not Adequately Described. Several other groups are working on similar projects. I cannot tell from this proposal how closely the applicant plans to work with these groups.**
-Poor	**My concerns are not necessarily serious criticisms of this proposal. In fact, a small amount of explanation and/or very minor changes in the workplan could satisfy all of my concerns.**

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The proposed work is timely and significant. The US Geologic Survey has fifteen years of data documenting the occurrence of organophosphate insecticides, especially chlorpyrifos, in California surface waters. The concentrations are high enough to cause toxicity of aquatic invertebrates, which threatens the stability of aquatic food chains and is a violation of the federal Clean Water Act. A large portion of this pesticide is run-off from prune, almond and walnut orchards, i.e., walnuts contribute significantly to the problem. The applicant's proposed pollution-prevention strategy -- eliminating chlorpyrifos by replacing it with environmentally benign mating disruption pheromones -- is far more satisfactory from an environmental perspective than trying to clean up the rivers after they become contaminated. Because the improved, alternative technology already exists and works on pears and apples, the challenge for walnuts is to increase adoption by growers, which is exactly what the applicant proposes to do. In short, the problem is real, and the applicant's approach makes sense.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Mating disruption technology has a long and promising track record in the research community, and in the last few years has been adopted by almond, pear and apple growers for use in the field. Professor Steven Welter has been instrumental in implementing mating disruption technology for codling moth in pears, and is a collaborator on this project. However, the applicant should have provided (p. 3, last paragraph, just above the bullet points) citations and figures on the amount of almond, apple and pear acreage managed with mating disruption technology. Citations for articles are given later (p. 14, section B. 5. System-Wide Ecosystem Benefits), but there are no figures on acreage already managed with pheromone mating disruption, and there is even a suggestion that success in walnuts will promote wider adoption in pears and apples. Since the success of the proposed work depends on adoption of mating disruption technology by walnut growers, and success with the technology in pome fruits is a key indicator of the likelihood of success in walnuts, we need to know the details of the track record in these other crops.

The applicant indicates (last paragraph of section 2, Justification) that "field and registration research on both of these options of the pheromone has been completed so that they will be ready for implementation in 2002." This is good news and supports the applicant's assertion that the technology is ready to go. However, just as in the criticism above, I would like to see some supporting documentation or citations. Has the California Department of Pesticide Regulation (DPR) registered these products for use? Can this project move forward if DPR has granted only experimental use permits? Until the products are registered, farmers cannot use them, which would be the end of this project's efforts to promote widespread adoption. The applicant clearly does not see a problem here, but I need a bit more explanation to know why.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The proposal identifies conditions favoring adoption of new, innovative technologies, and explains how mating disruption pheromones fit these conditions.

   The applicant indicates they will work cooperatively with "growers and their organizations, crop consultants, researchers and farm advisors." Including such a broad diversity of stakeholders is a good idea, will improve the likelihood of adoption of the new mating disruption technology, and has long track record of success here in CA, in other states, and abroad. I particularly like the inclusion PCAs and farm advisors from the beginning and throughout the project, which improves documentation, creates a network for distributing information to growers, and makes possible rapid expansion to larger acreage and more growers. However, the applicant should have indicated (p. 5, last paragraph) who exactly are the cooperators, and included some indication of their support for and roles in the proposed work. Specifically, I would have liked to see letters from walnut growers, walnut commodity groups such as the California Walnut Commission and Diamond Walnut Growers, PCAs, and University of California Cooperative Extension Farm Advisors. I cannot tell if the lack of this documentation indicates a lack of support from critical sectors, or whether there was no place in the application package to include the documentation.

   I also liked the inclusion - as an integral and beginning piece of the project - meetings with growers to discuss what specific information growers need to try the new technology and to evaluate its success. Including growers, who are the ultimate decision-makers, in this process makes it possible to identify and correct problems early on, and greatly increases the likelihood of adoption. Frequent project evaluation is a great idea, and one that too often has been lacking

in similar agricultural programs.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   Plans for widespread adoption (25,000 acres over 3 years) are ambitious, but in keeping with the scale of this organization's successful projects with six other crops around the nation. This project should reduce chlorpyrifos use in walnuts, and should serve as a model for reducing pesticide use on other crops. Unfortunately, because urban areas as well as other crops besides walnuts all contribute to the problem of chlorpyrifos in surface waters, the direct impact of this project on water quality will be difficult to measure.

   I am concerned by the lack of explicit coordination with the other organizations working on this topic. A recent publication (http://www.sarep.ucdavis.edu/bifs/bifs01/index.htm) from the University of California Sustainable Agriculture Research and Education Program (UC SAREP) describes how Walnut Marketing Board, the Walnut Pest Management Alliance, California Department of Pesticide Regulation, the University of California, and Cooperative Extension Farm Advisors are already working together to stimulate wide-scale adoption of mating disruption technology as an alternative to chlorpyrifos for codling moth in walnuts, which is pretty close to the work proposed in this grant application. The applicants indicate (Section 4. Feasibility) they are aware of similar work being conducted by these groups, but I would like the applicant to explain how these efforts fit together, and how the proposed project will build upon these existing programs.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   The Work Schedule is clear as far as it goes, but I would like to see more details that would indicate the intermediate measures of success. For example: How many growers will be enrolled in the program? How many acres will each grower enroll? How many meetings will be held, and how many growers are expected at each meeting? When and where will the meetings be held? How will the growers be recruited? What will be done to increase participation if an insufficient number of growers and acres are enrolled?

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The focus of this project is on changing farmer practices. If farmers substitute environmentally benign mating disruption technology for codling moth, they will stop using chlorpyrifos and other organophosphate insecticides that harm aquatic life in California's surface waters. I agree with the applicant that it is appropriate to focus on farmers since farmers are the ultimate decision makers about using these insecticides. However, I would like to see a more direct connection to surface water quality, which is really the point of this grant program. This is especially important because of the continued insistence by some farm commodity groups that the chlorpyrifos problem is due to urban run-off. I believe it would be relatively easy to improve the connection between on-farm pesticide use and clean water goals by adding two small components to this project: 1. Analyze the pesticide use of the growers enrolled in this project by comparing their pesticide use to the county averages. The California Department of Pesticide Regulation already collects data on pesticide use, and very little effort would be required to

obtain pesticide use records related to this project. 2. Compare the changes in farmers' pesticide use with the chlorpyrifos levels that the USGS measures in the rivers. These additions could be incorporated easily into the proposed grower interviews and reports.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The applicant, Larry Elworth and his Center for Agricultural Partnerships, is known for managing large-scale IPM implementation projects around the country (described briefly under section 4, Feasability). Project Manager, Pat Weddle, is nationally known as an excellent PCA and is an expert on codling moth management in the study area.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   US EPA awarded the applicant a small ($30K) grant for this project (as indicated under Project Information, item 20). However, the funding from EPA was not sufficient to support the entire project. Therefore, I am pleased that the applicant is looking for additional funding through CALFED.

   If and when this grant is awarded, I suggest the CALFED project officer should ask for a complete budget that clearly indicates how the two funding sources (US EPA and CALFED) are being allocated. We do not want any perception of double-dipping.

Miscellaneous comments:

External Scientific: #5

Research and Restoration External Scientific Review Form

Proposal Number: **41**

Applicant Organization: **Center for Agricultural Partnerships**

Proposal Title: **Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The proposal is well written in most areas, but is considerably lacking in some scientific areas (e.g. no testable hypotheses). The parts of a successful project are there, but they need to be more tightly woven together for a more cohesive proposal.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goals and objectives were stated very clearly. However, throughout the entire proposal, I failed to find a testable hypothesis. I think the concept is important and very timely given the current TMDL situation, but without a testable hypothesis, it is difficult to evaluate.

2. **<u>Justification.</u>** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The authors do a good job of justifying their study based on current knowledge and conditions. The foundation for the proposed work is well established.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach as written is very clear, however, there are potential problems, since no definitive testable hypothesis was ever stated. This "reduction" will only work in theory, if an entire upper watershed is involved. If not, chlopyrifos from upstream could easily move downstream, contaminating aquatic resources at your study site. Also, chlorpyrifos is heavily used in urban areas (e.g. termite treatments). Are there any indications of quantifiable urban runoff contribution in these areas? I think if some of these basic questions can be answered, the project will be capable of generating extremely valuable information which will be most novel and useful for all branches of decision making, from farm-level to regulatory-level.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   As pointed out in the approach section, there are some questions which need to be addressed to help clarify project intentions. If these are sufficiently accounted for, the liklihood of success which increase greatly, allowing it to fall more along the lines of the original objectives.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Performance measures were not clearly defined in the proposal, and are therefore difficult to measure.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The products were well outlined and will be of value to the consumers.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The capabilities were very good and thorough. There was no doubt that the investigators were more than capable of producing a good product and sufficiently trained to do so. It appears the infrastructure and other necessary support are present.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   The cost/benefit analysis was not clearly defined. The budget itself is reasonable and feasible for the proposed work, but specific cost/benefit analysis for the objectives would be beneficial to the reviewer.

Miscellaneous comments:

To "improve water quality" and "reduce risk to aquatic species", you must have measurable examples. There needs to be some quantifiable data. What are your target endpoints? There needs to be some sort of analytical chemical measurement of inflow vs. outflow concentrations of pesticides if you are to say the above statements.

Is this research supposed to show that pheromones work as good or better than chlorpyrifos? This really goes beyond just reducing the loads. You must reduce the input. For example, if you have erosion problems and chlorpyrifos contamination, reducing the amount of chlorpyrifos will not do as much for the system as finding methods to reduce the erosion in the first place.

Will farmers initially be compensated for potential crop loss due to new treatment methods, rather than conventional pesticide treatment? Will you really be able to get that much cooperation without any financial incentive?

Are there any considerations for alternative pesticide uses that are naturally derived, rather than synthetically produced?

You mentioned that this was mainly educational, and I can see the practicality of that, but you must incorporate some measureable endpoints on success--that this pheromone treatment is BETTER than chlorpyrifos (or not), and if it is better, by how much? Again, you should strive for quantifiable numbers. The chlopyrifos reduction, although extremely important, is essentially secondary to the previous statement. You need solid evidence that this pheromone treatment is MORE effective than comparable OP's in walnuts, as it has been seen in other fruit crops.

Also, the title is misleading. It may be a consequence of the pheromone treatment, but it is not representative of this proposal.

I hope you can succeed with this proposal. I think the underlying science is much needed and could generate valuable information. But without quantifiable data, you will be hard-pressed to give definitive answers to your stated questions.

Environmental Compliance:

Proposal Number: 41

Applicant Organization: Center for Agricultural Partnerships

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   XYes **-**No

   If no, please explain:

   No permits or environmental documentation necessary; mainly education and sampling only for agricultural pests.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   XYes **-**No

   If no, please explain:

   N/A

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 41

Applicant Organization: Center for Agricultural Partnerships

Proposal Title: Improving water quality by reducing pesticide loadings in the Sacramento and San Joaquin River system through the wide scale use of environmentally sound farming practices in walnut production

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   XYes **-**No

   If no, please explain:

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   XYes **-**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

If no, please explain:

7. Are there other budget issues that warrant consideration?

   -Yes **X**No

   If yes, please explain:

Other Comments: